

"Made available under NASA sponsorship  
in the interest of early and wide dis-  
semination of Earth Resources Survey  
Program information and without liability  
for any use made thereof."

STIF  
E7.3 1053873  
CR-131614

CENSUS CITIES EXPERIMENT IN URBAN CHANGE DETECTION

James R. Wray  
Geographic Applications Program  
U.S. Geological Survey  
Washington, D.C. 20244

(E73-10538) CENSUS CITIES EXPERIMENT IN  
URBAN CHANGE DETECTION Progress Report,  
1 Mar. - 30 Apr. 1973 (Geological  
Survey) 6 p HC \$3.00 CSCL 08B

N73-22302

Unclas  
G3/13 00538

1 May 1973

Type I Progress Report for Period 1 March 1973 - 30 April 1973

Prepared for:

Goddard Space Flight Center  
Greenbelt, Maryland 20771

Publication authorized by the Director, U.S. Geological Survey

- a. Census Cities Experiment in Urban Change Detection. (ERTS-A Proposal No. SR-273)
- b. IN-084
- c. Statement and explanation of any impedance.

ERTS underflight photography has been received for all mandatory test sites except Pontiac. We are not receiving any 70 mm positive transparencies (two each band) nor 9 x 9 inch color composites (one each band) for any test sites as specified in our data product request.

- d. Accomplishments during the reporting period and those planned for the next period.

Land use change detection analysis for the Washington test site by GAP inhouse staff has been completed. Land use analysis of the Tucson area at the University of Arizona is nearing completion. Work continues at USGS, Denver on the compilation of 1970 land use boundaries for Boston. Open file compilation of 1970 land use is planned also for New Haven and Pontiac. San Francisco change detection analysis by Feng and associates at USGS, Menlo Park has been completed for over half of the 44 25 x 25 km Atlas mosaic sheets. Computer listing of all area analysis tabulations for San Francisco is underway.

The first proof sheets for the San Francisco "Hayward" land use sheet have been received. Open file release of the Hayward land use map at scales of 1:62,500 and 1:125,000 is planned for mid-May. Meanwhile, USGS Publications is reviewing the one-sheet

land use map at 1:100,000 for the Washington area prior to official release. The Metropolitan Washington Council of Governments, on behalf of the user community, has also been asked to review the Washington land use map.

The Pittsburgh test site was flown on March 23 by NASA U-2 aircraft. The photography has not yet been received.

Two Bausch and Lomb Zoom Transfer Scopes have been received, one at the GAP office in Washington, and the other at USGS, Menlo Park for use in the change detection analysis for San Francisco.

An unsolicited proposal is being prepared by Robert Simpson at Dartmouth College to do Census Cities land use change analysis from 1972 high altitude aircraft and satellite imagery for Boston and New Haven. The Council on Environmental Quality has requested, and has been provided with, graphic Census Cities land use data for Boston for inclusion in their Fourth Annual Report.

Contract negotiations are underway with the Association of American Geographers for work on the development of an urban spatial growth model and the preparation of a procedural manual on metropolitan analysis using remote sensing.

User contacts during the reporting period included the following: Commonwealth Club of California, Council on Environmental Quality, Appalachian Regional Commission, and USGS Urban Studies program.

e. Scientific results and practical applications. (Category 2E):

Work continues on the experimentation with computer compatible tapes for an early ERTS-1 MSS image over the San Francisco Bay Area to classify and analyze land use in this metropolitan region. NASA aircraft underflight data and land use maps from the Census Cities ERTS-1 experiment are providing "training samples." The tape record has been reformatted for use with the LARSYSSA pattern recognition and classification algorithms developed at the Purdue University Laboratory for Application of Remote Sensing. Trial land use classification systems are being compared with color infrared photography and ground truth data for San Jose and vicinity. Preliminary results have shown that seven different land use categories can be identified, using 14 combinations of spectral band and spectral density from the ERTS-1 digital record for a sample area 9 km by 18 km in size at a print-out scale of approximately 1:24,000. Details of this work were reported by James Wray at the NASA ERTS-1 Symposium at New Carrollton, Maryland, March 5-9, 1973.

False color infrared enlargements at 1:100,000 of selected ERTS MSS images provided as part of the Census Cities ERTS-1 experiment are being ordered for all mandatory test sites. Transparencies and color prints at this scale have been received for the Washington test area.

Land use change polygons for a sample portion of the Washington test area have been identified successfully on the ERTS MSS color infrared enlargements at 1:100,000 in conjunction with initial change identification from 1972 high altitude photography. Actual use categories, however, could not be determined solely from the ERTS imagery.

f. Published reports or talks.

"Indications of Intra-Urban Environments of Washington, D.C. Interpretable from ERTS MSS Imagery," by James R. Wray, oral presentation at the NASA ERTS-1 Symposium, New Carrollton, Maryland, March 5-9, 1973.

"Classifying Land Use in a Metropolitan Region by Digital Processing of ERTS-1 Multispectral Scanner Data," by James R. Wray, oral presentation at the NASA ERTS-1 Symposium, New Carrollton, Maryland, March 5-9, 1973.

James Wray gave an invited lecture on March 28 at City College, N.Y., Environmental Geology Series. He also talked to RALI program representatives on March 30. He spoke to a group of about 35 planners and members of the Appalachian Regional Commission at Pittsburgh on April 9. Planned talks include the following: invited lecture at Montgomery College, Rockville, Maryland, May 10, participation in remote sensing session at meetings of the Association of Pacific Coast Geographers, San Diego, June 14-16, talk at Association of American Geographers Middle Atlantic Division dinner meeting June 6, paper at EROS

Data Center training course, October 29-November 2, and a course on urban applications of remote sensing at a meeting of the National Council on Geographic Education, Washington, November 10-13. In addition, Lay Gibson (University of Arizona Geography Department), who is conducting Census Cities land use work for Tucson, will report on this work at a meeting of the Arizona Academy of Sciences in mid-May. Richard Ellefsen and Duilio Peruzzi will be describing aspects of the Census Cities ERTS Experiment (previously reported in progress reports or other papers) at the San Diego meeting in June. James Feng and Duilio Peruzzi will also be presenting papers at meetings of the California Council on Geographic Education in San Jose on May 5. Exhibits from the Census Cities experiment will be on display at the San Diego and San Jose meetings. A new exhibit showing the monitoring of urban growth by satellite simulation and observation is on display at annual meetings of the Association of American Geographers, Atlanta, April 15-19.

g. Recommendations for improvement.

No additional recommendations since those noted last reporting period.

h. A major change in the Standing Order form.

No new changes since those noted last reporting period.